

*✓ Amended on 11/25/02*

Serial No. 10/034,379  
OKI.291

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- ✓ oxidizing the regions exposed partially on the one surface of said wafer and the whole area of the other surface of said wafer simultaneously to grow a silicon dioxide film on both surfaces of said wafer; and
- ✓ removing said oxidation inhibitor film overlying said pad oxide film and the underlying pad oxide film remaining on the one surface of said wafer.

## REMARKS

By this Amendment, the specification has been revised as suggested by the Examiner, and further Claim 1 has been revised to correct the typographical error noted by the Examiner and other minor errors.

Claims 1-7 remain pending in the application.

Claims 1-4 and 6-7 were rejected under 35 U.S.C. ¶103 as being obvious over the Background of the Invention (BOI) in view of Halliyal et al. and Numasawa for the reasons stated at pages 2-4 of the Office Action. However, noting that the Examiner has apparently misread the BOI of the present application, reconsideration of the rejection is requested.

In the Office Action, the Examiner states:

"Regarding claim 1, BOI, pages 1-3 discloses ... patterning said pad oxide film and an oxidation inhibitor film on said pad oxide film on one surface of said wafer to form desired patterns to partially expose the one surface of said wafer through said patterns; removing said pad oxide film and said oxidation inhibitor film on said pad oxide film formed on

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the other surface of said wafer to expose the whole area of the other surface of said wafer... .” (Emphasis added.)

However, Applicants respectfully point out that the BOI does not teach removing the pad oxide film formed on the other surface of the wafer. Rather, only the silicon nitride film (oxidation inhibitor) is removed. In particular, the paragraph bridging pages 1 and 2 of the specification reads as follows:

“Subsequently, the pad oxide film and the silicon nitride film on the pad oxide film on one surface of the wafer are removed from the one surface, namely, the front surface of the wafer by patterning. Then, the silicon nitride film on the pad oxide film is removed from the other surface of the wafer with the pad oxide film remaining.” (Emphasis added.)

Also see page 2, lines 6-9, which reads as follows:

“On the reverse side, however, because the surface on this side is covered with the pad oxide film consisting of silicon dioxide, only a trace amount of silicon dioxide grows under the pad oxide film, so that the pad oxide film covering the reverse surface does not substantially increase in thickness.”

✓ Neither the BOI nor the remaining cited references teach or suggest removing both the pad oxide film and the oxidation inhibitor film on the other surface of said wafer to expose the whole area of the other surface of the wafer prior to oxidation.

For at least these reasons, Applicants respectfully contend that the presently claimed invention would not have been obvious to one of ordinary skill in view of the BOI, Halliyal et al. and Numasawa, taken individually or in combination.

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No other issues remaining, reconsideration and favorable action upon the  
Claims 1-7 now-pending in the application are requested.

Respectfully submitted,

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**ATTACHMENT "A"**

covering the other surface of the wafer may be removed to expose the whole area of the other surface of the wafer.

Therefore, simultaneously with the selective oxidation of the exposed regions on the one surface, an oxide film may be grown on the whole area of the other surface. At this time, on the other surface, because of its not being covered with the pad oxide film unlike in the prior art, a pad oxide film can be grown to substantially the same thickness as on the exposed regions on the one surface. This oxide film may be used as the protective film to prevent contamination and may also be used as a sacrifice layer to clean 10 contamination.

The oxidation inhibitor film may be a silicon nitride film.

The pad oxide films covering both surfaces of the wafer may be formed simultaneously in a batch type thermal oxidation furnace.

The silicon nitride films covering both surfaces of the wafer with 15 interposition of the pad oxide film may be formed simultaneously by a batch type low-pressure CVD.

The exposed regions on the one surface of the wafer and the exposed area on the other surface of the wafer may be subjected to the oxidation process by a batch type thermal oxidation furnace.

20 The oxide film partially formed on the one surface of the wafer may be used isolation regions.

The oxide film formed on the whole area of the other surface of the wafer may be used as a sacrifice layer to remove contamination, which occurs in handling of the wafer, by an etching process.

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**BRIEF DESCRIPTION OF THE DRAWING**

*Figs. 1(A) through 1(G)*

*Fig. 1 shows process steps of a selective oxidation method according to*

the present invention.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

An embodiment of the present invention will be described in detail with  
5 reference to the accompanying drawings.

~~Figs. 1(A) through 1(E)~~  
~~Figs. 1~~ shows process steps of an embodiment of a selective oxidation method according to the present invention.

As shown in Fig. 1(A), the whole areas of both surfaces 10a and 10b of a semiconductor wafer are covered with a silicon nitride film 13 or 14 with 10 interposition a pad oxide film 11 or 12. The pad oxide films 11 and 12 a, as has been well known, serve to reduce a differential thermal expansion between the wafer 10 and the silicon nitride film 13 or 14 to prevent the wafer 10 from being distorted.

The pad oxide films 11, 12 and the silicon nitride films 13, 14 may be 15 formed in succession on the front surface 10a as one surface of the wafer 10 and on the reverse surface 10b.

However, as has been well known, it is preferable to use a batch type furnace, not shown. With the batch type furnace, a number of semiconductor wafers can be held standing up on their edges or lying horizontal mutually 20 spaced apart on a well-known boat, and by being exposed to the oxidizing atmosphere in the thermal oxidation furnace, the pad oxide films 11 and 12 can be formed collectively on the front surface 10a and on the reverse surface 10b of each of the wafers 10.

After the pad oxide films 11 and 12 have been formed, silicon nitride 25 films 13 and 14 may be formed on the pad oxide films, but as have been described, preferably, silicon nitride films 13 and 14 should be formed collectively on the pad oxide films 11 and 12 formed on both surfaces 10a and

What is claimed is:

ATTACHMENT "B"

(Amended)

1. A method for selectively oxidizing a silicon wafer comprising the steps of covering each of whole areas of both surfaces of a silicon wafer by an oxidation inhibitor film with interposition of a pad oxide film; patterning said pad oxide film and an oxidation inhibitor film on said pad oxide film on one surface of said wafer to form desired patterns to partially expose the one surface of said wafer through said patterns; removing said pad oxide film and said oxidation inhibitor film on said pad oxide film formed on the other surface of said wafer to expose the whole area of the other surface of said wafer; oxidizing the regions exposed partially on the one surface of said wafer and the whole area of the other surface of said wafer simultaneously to grow a silicon dioxide film on both surfaces of said wafer; and removing said ~~oxide~~ <sup>oxidation</sup> inhibitor film overlying said pad oxide film and the underlying ~~said underneath~~ pad oxide film remaining on the one surface of said wafer.
2. A selective oxidation method according to Claim 1, wherein said oxidation inhibitor film is a silicon nitride film.
3. A selective oxidation method according to Claim 1, wherein said pad oxide films covering both surfaces of said wafer are formed simultaneously in a batch type thermal oxidation furnace.
4. A selective oxidation method according to Claim 2, wherein said silicon nitride films covering both surfaces of said wafer with interposition of said pad oxide film are formed simultaneously by a batch type low-pressure CVD.
5. A selective oxidation method according to Claim 1, wherein said